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Forces and Motion [2nd grade]

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Unit: Forces and Motion

Grade: 2

Stage 1: Desired Results

Understandings

Students will understand that...

- All machines are forms or combinations of six simple machines (inclined plane, lever, pulley, screw, wedge, wheel and axle).
- Simple machines are tools that make work easier and have greatly affected how we live today.

Essential Questions

Knowledge & Skill (NEISD scope & sequence; TEKS; Core; etc.)

- 1) How can simple machines make work easier?
- 2) How would life be different if we didn't have one or more simple machines?

Vocabulary

force

friction

inclined plane

lever

pulley

screw

wedge

wheel and axle

work

energy

attract

magnet

magnetic field

magnetic pole

magnetism

north pole

repel

south pole

- (NEISD scope & sequence; TEKS; Core; etc.)
 TEKS:
 - 2.1 Scientific Processes. The student conducts classroom and field investigations following home and school safety procedures.
 - 2.2 Scientific Processes. The student develops abilities necessary to do scientific inquiry in the field and the classroom.
 - 2.2B Plan and conduct simple descriptive investigations.
 - 2.2C Compare results of investigations with what students and scientists know about the world
 - 2.3 Scientific Processes. The student knows that information and critical thinking are used in making decisions.
 - 2.5 Science Concepts. The student knows that organisms, objects, and events have properties and patterns.
 - 2.5Å Classify and sequence organisms, objects, and events based on properties and patterns.
 - 2.6 The student knows that systems have parts and are composed of objects.
 - 2.6A Manipulate, predict, and identify parts that, when separated from the whole, may result in the part of the whole not working, such as flashlights without batteries.
 - 2.6B Manipulate, predict, and identify parts that, when put together, can do things they cannot do by themselves, such as guitar and guitar strings.
 - 2.7 Science Concepts. The student knows that many types of change occur.
 - 2.7A Observe, measure, record, analyze, predict, and illustrate changes in size, mass, temperature, color, position, quantity, sound, and movement.
 - 2.7C Demonstrate a change in the motion of an object by giving the object a push or pull.

Stage 2: Assessment Evidence

Performance Task:

- Students will create their own simple machine. (Invention Convention)
- Students identify one thing in life that would be different if we had never discovered this machine. Present to class.
- Test on simple machines
- Students will identify the type of energy each object produces in journal form
- Group experiment called "Electric Breakfast" (static electricity). Students will produce a graph to show results.
- Class will produce a graph to show understanding that sound is created by air passing over the vocal chords. ("A Real Humdinger")

Other evidence:

(quizzes, tests, academic prompts, etc.

note – these are usually included where appropriate in Stage 3 as well)

Stage 3: Learning Activities

(Steps taken to get students to answer Stage 1 questions and complete performance task)

- Classroom rotations to demonstrate/experience the six simple machines.
- Observe and experiment with different types of energy to identify, "What is work?" (heat, light, sound, electricity, and motion)
- Students will interact with a variety of rough and smooth surfaces that demonstrate different amounts of friction.
- Science Lab sound experiences.
- Students match like sounds to each other. Technology activity to review vocabulary.

Self-Assessments:

Related Literature:

Back and Forth by Patricia J. Murphy

Experiments with Magnets: A True Book by Salvatore Tocci

Forces Around Us by Sally Hewitt

Push and Pull by Patricia J. Murphy

Simple Machines by Allan Fowler

What is a Plane? by Lloyd G. Douglass

What is a Pulley? by Lloyd G. Douglass

What is a Screw? by Lloyd G. Douglass

What is Friction? by Lisa Trumbauer

Mickey's Magnet by Franklin Branley

Mike Mulligan & His Steam Shovel by Virginia Burton

Alexander & the Wind-up Mouse by Leo Lionni

Other Evidence, Summarized Related Media:

Helen Keller Bill Nye